PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PWO041452	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)

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International Patent Classification (IPC) or both national classification and IPC G06F17/50

Applicant QUESTERRA LLC et al.

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 9 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 12 sheets.

3. This report contains indications relating to the following items:

   I   ☒   Basis of the opinion

   II   ☐   Priority

   III   ☐   Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

   IV   ☐   Lack of unity of invention

   V   ☒   Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

   VI   ☐   Certain documents cited

   VII   ☐   Certain defects in the international application

   VIII   ☐   Certain observations on the international application

Date of submission of the demand 15.07.2004	Date of completion of this report 31.03.2005

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INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

International application No.   **PCT/US 03/39945**

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)):*

Description, Pages

1-20   as originally filed

Claims, Numbers

1-45   received on 18.01.2005 with letter of 18.01.2005

Drawings, Sheets

1/26-26/26   as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐   the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐   the language of publication of the international application (under Rule 48.3(b)).
- ☐   the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐   contained in the international application in written form.
- ☐   filed together with the international application in computer readable form.
- ☐   furnished subsequently to this Authority in written form.
- ☐   furnished subsequently to this Authority in computer readable form.
- ☐   The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐   The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐   the description,   pages:
- ☐   the claims,   Nos.:
- ☐   the drawings,   sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-45
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-45
Industrial applicability (IA)	Yes:	Claims	1-45
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

V.1 Prior Art

The following documents are referred to in this communication; the numbering will be adhered to in the rest of the procedure:

D1: TYRRELL C J: "CUSTOM NETWORK DESIGN AND PRICING TOOLS" BT TECHNOLOGY JOURNAL, BT LABORATORIES, GB, vol. 18, no. 2, April 2000 (2000-04), pages 30-35, XP000958410 ISSN: 1358-3948

D2: FIDDIAN N J ET AL: "A KNOWLEDGE PROCESSING SYSTEM FOR DATA SERVICE NETWORK DESIGN" BT TECHNOLOGY JOURNAL, BT LABORATORIES, GB, vol. 17, no. 4, October 1999 (1999-10), pages 117-130, XP000896269 ISSN: 1358-3948

D3: FISHER M ET AL: "TECHNIQUES FOR AUTOMATED PLANNING OF ACCESS NETWORKS" BT TECHNOLOGY JOURNAL, BT LABORATORIES, GB, vol. 14, no. 2, 1 April 1996 (1996-04-01), pages 121-127, XP000584919 ISSN: 1358-3948

D4: MATEUS G R ET AL: "Computer-aided tools for the telecommunication network design" INTERNATIONAL CONFERENCE ON SOFTWARE IN TELECOMMUNICATIONS AND COMPUTER NETWORKS. SOFTCOM '98 UNIV. SPLIT SPLIT, CROATIA, 14 October 1998 (1998-10-14), pages 347-356, XP009036000 ISBN: 953-6114-29-1

D1 is considered to be the closest prior art for the remainder of this communication.

V.2 Objections under Article 33 PCT (Inventive Step)
The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1 to 45 does not involve an inventive step in the sense of Article 33(3) PCT.

1. Document D1 discloses:

i)   *"receiving a selection of customer sites"*; see e.g. p. 31, right col., l. 21-23

ii)   *"querying a database to determine geographical locations of the selected customer sites"*; see e.g. p. 31, right col., l. 24-25

iii)   *"rendering, in a graphical user interface, representations of the selected customer sites in a map at the geographical location of the selected sites in the map"*; see e.g. p. 31, right col., l. 23; fig. 2

iv)   *"querying the database to determine network infrastructure and geographical locations of the determined network infrastructure"*; see e.g. section 3, especially p. 31, right col., l. 28-p.32, l.1; figs. 1 and 3; e.g. the POP locator component;

D1 discloses that the design engines calculate the best network infrastructure for the services selected, e.g. suitable POPs, link aggregations, etc. Therefore, D1 discloses that network infrastructure is determined. Furthermore, POP locations are calculated. Therefore, the geographical location of the determined network infrastructure is also determined. From fig. 1 can be seen that the LAN/WAN design engine uses product and service expert knowledge bases. Therefore, the use of a database for determining the network infrastructure (which includes calculating an optimal network infrastructure) is also disclosed by D1.

v)   "rendering representations of the determined network infrastructure in a map at the determined geographical locations of the determined network infrastructure to render a visualization of the geographical locations of the selected customer sites and network infrastructure of the selected at least one NSP in the map.; see e.g. p. 31, right col., l. 28 - 32;

POP locations are plotted on the map which already contains the representations of the customer locations. Additionally, fig. 2 shows an example where customer site location data is rendered together with determined physical network links which are part of the existing network infrastructure of the network provider.

2.   The subject-matter of claim 1 **differs** in that '*a selection of at least one network*

service provider (NSP) is received'.

3.   The **problem to be solved** by the present invention may therefore be regarded as *'how to apply the network design method of D1 to different network service providers'.*

4.   The **solution** proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons.

The method as disclosed in D1 requires that at least one service network provider is known to the design method. If this method should be applied to different NSPs than it is obvious that a selection between the NSPs has to be done so that the network design method can be applied upon the selected NSPs.

Furthermore, if information about the infrastructure of the NSPs is required than it is obvious that the network design method will query and use the network information describing the infrastructure of the selected NSPs.

Therefore, the inclusion of the feature of receiving a selection of at least one NSPs into the design method disclosed in document D1 is regarded as being obvious for a person skilled in the art.

5.   The same argumentation as for claim 1 is valid, mutatis mutandis, for **independent claims 16 and 31**.

6.   The following **dependent claims** do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of **inventive step**, the reasons being as follows:

A) claims: 2, 4, 5, 7, 11, 13, 17, 19, 20, 22, 26, 28, 32, 34, 35, 37, 41 and 43:
            see figs. 2 and 3; p. 31, right col. l. 21 to p. 32 right col., l. 9;

   i) The features of the above cited claims are either disclosed by D1 (see e.g. p. 31, right col., l. 21 to p. 32, right col. l. 13; figs. 2 and 3 or regarded as standard features which are known to a person skilled in the art so that the inclusion of

such features would be obvious for the skilled person.

ii) D1 discloses (on p. 31, l. 25 to 27) that CPE information is added to the GUI map as part of the definition process of defining the customer requirements. D1 does not disclose in detail how these customer requirements are entered into the system and in what detail customer information is displayed on the user interface.

But a person skilled in the would know that customer requirement information has to be entered into the system via an interface and that the level of detail of displayed information depends on the specific network design for the customer. The use of interactive user interfaces for adapting the displayed information to the users needs is well known in the art. Therefore, the possibility to select displayed information (e.g. rendered customer sites) to allow the display of more detailed information in addition to the already displayed information is regarded as being well known to the skilled person.
The skilled person would therefore regard it as a normal design option to include this feature into the design method disclosed in D1.

B) claims: 3, 6, 8-10, 12, 14-15, 18, 21, 23-25, 27, 29-30, 33, 36, 38-40, 42, 44-45

these claims contain features of:

a)   displaying network design data superimposed over maps (cl. 3, 12, 18, 27, 33, 42),

b)   using visual means for distinguishing between network elements which satisfy or do not satisfy given criteria (cl. 6, 9, 21, 24, 36, 39),

c)   using a buffer region for determining network infrastructure and displaying it on a map (cl. 8, 14, 23, 29, 38, 44),

d)   generating a report for the network design data including distance data (cl. 10, 15, 25, 30, 40, 45).

with reference to a)
The use of maps with superimposed network design data is disclosed in D1 (see e.g. p. 31, right col., l. 21 to p. 32, right col. l. 13; figs. 2 and 3). D1 does not disclose in fig. 2 the display of transportation corridors. But if the technical problem

to be solved is to provide more detailed information on the maps then to use of finer grained maps with the required level of detail (e.g. information about transportation corridors) would be obvious for the person skilled in the art.

Alternatively, documents D3 (e.g. figs. 2, 3 and 4) and D4 explicitly disclose the use of graphical information about transportation corridors in combination with rendered customer sites and network infrastructure for the purpose of designing a network. The skilled person would therefore regard it as a normal design option to include this feature in the system and method described in document D1 in order to solve the problem posed.

with reference to b)
The use of visual or graphical means within GUIs to distinguish suitable information from unsuitable information is well known in the art.

with reference to c)
The use of buffer regions for determining network infrastructure is disclosed in D2 (see e.g. p. 119 to 123, sections 2 and 3; fig. 3 a)). Fig. 3 a) shows the GUI for the BT user agent for querying POP information which provides the possibility of entering the radial distance (which is equal to the definition of a buffer region) for determining POPs which are suitable or unsuitable (e.g. being outside of the specified geographical radius), see e.g. p. 123, paragraph 'Querying'. Suitable POPs are displayed to the user, ranked in order of proximity to the customer site.

D2 does not disclose that the retrieved POPs are rendered into a map in combination with the customer sites. But in combination with D1, which already renders POP information together with customer site information in a map, it is obvious for a person skilled in the art to combine the rendered map of D1 with the POP information provided by the method and system of D2.

Additionally, rendering the POP information of D2 into a map instead of displaying the POP information as a list as in D2 is regarded as a well-known alternative method for displaying geo-coded information.

Furthermore, documents D3 and D4 also teach the use of urban maps for

designing networks so that the <u>spatial arrangement between the elements</u> can be seen. In particular, network infrastructure and POP information is displayed on the maps, see e.g. D4, fig. 3 and p. 353, paragraph about the CONET system.

with reference to d)
The generation of reports containing network design data is disclosed in D1 (see e.g. p. 32, right col., l. 1 to 13).

WHAT IS CLAIMED IS:

1   1.   A method, comprising:

2   receiving a selection of customer sites;

3   querying a database to determine geographical locations of the selected ~~network~~

4   customer sites; .

5   rendering, in a graphical user interface, representations of the selected customer

6   sites in a map at the geographical location of the selected sites in the map;

7   receiving selection of at least one network service provider (NSP);

8   querying the database to determine network infrastructure of the selected NSP and

9   geographical locations of the determined network infrastructure; and

10   rendering representations of the determined network infrastructure in a map at the

11   determined geographical locations of the determined network infrastructure to render a

12   visualization of the geographical locations of the selected customer sites and network

13   infrastructure of the selected at least one NSP in the map.

1   2.   The method of claim 1, wherein the determined network infrastructure

2   comprises at least one of a switch and a network path, and wherein the network

3   infrastructure geographical location comprises at least one of a switch site location and a

4   route of the network path.

1   3.   The method of claim 1, wherein the map comprises a street map, and

2   wherein the rendered map visualizes transportation corridors, and wherein the rendered

3   customer sites and network infrastructure are visualized superimposed over rendered

4   transportation corridors in the street map.

1   4.   The method of claim 1, further comprising:

2   receiving user selection of one rendered customer site;

3   querying the database to determine information on the selected customer site; and

4   rendering the determined information on the selected customer site in a dialog

5   box.

1   5.   The method of 1, further comprising:

2   querying connection information in the database to determine connections

3   between the rendered customer sites; and

4   rendering connections between the customer sites in the map to visualize the

5   determined connections.

1   6.   The method of claim 5, further comprising:

2   receiving a query including search criteria with respect to a parameter concerning

3   network connectivity at the customer sites;

4   querying the database to determine connections between customer sites having

5   network connectivity information satisfying the search criteria included with the query;

6   and

7   rendering the determined connections in a different visual manner than those

8   connections that do not satisfy the search criteria.

1   7.   The method of claim 5, wherein the connection information includes

2   information on at least one of connected sites, connection bandwidth, and connection

3   circuit types.

1   8.   The method of claim 1, further comprising:

2   receiving a definition of a buffer region with respect to a selected customer site;

3   querying the database to determine NSP network infrastructure located within the

4   defined buffer region;

5   rendering the buffer region around the rendering of the selected customer site in

6   the map; and

7   rendering the determined NSP network infrastructure within the defined buffer

8   region in the map.

1   9.   The method of claim 8, wherein NSP network infrastructure rendered

2   within the defined buffer region is rendered differently than NSP network infrastructure

3   rendered outside of the buffer region.

1   10.   The method of claim 8, further comprising:

2   generating a report identifying at least one of: the network infrastructure located

3   within the buffer region, the NSP managing the identified network infrastructure, and a

4   distance of the identified network infrastructure from the selected customer site for which

5   the buffer region is defined.

1   11.   The method of claim 1, wherein the network infrastructure includes

2   network switches and network paths, wherein rendering the representations of the

3   determined network infrastructure comprises rendering representations of the determined

4   switches in the map, further comprising:

5   querying the database to determine network paths between the network switches

6   rendered in the map; and

7   rendering the network paths between the network switches in the map.

1   12.   The method of claim 11, wherein the map comprises a street map, and

2   wherein the network paths are rendered superimposed over transportation corridors

3   rendered on the map.

1   13.   The method of claim 11, further comprising:

2   receiving user selection of a proposed path between the customer site and one

3   network switch;

4   rendering the proposed path in the map; and

5   generating and rendering information on the proposed path in the map, including

6   information on the distance of the proposed path.

1   14.   The method of claim 1, further comprising:

2   receiving selection of a plurality of customer sites rendered in the map;

3   receiving a definition of parameters of a buffer region with respect to the selected

4   customer sites;

5   determining buffer regions for each of the selected customer sites satisfying the

6   defined parameters for the buffer region;

AMENDED SHEET

7   querying the database to determine NSP network infrastructure located within

8   each determined buffer region;

9   rendering each determined buffer region around each selected customer site in the

10 map; and

11   rendering the determined NSP network infrastructure within each defined buffer

12 region in the map.

13

1   15.   The method of claim 14, further comprising:

2   generating a report identifying at least one of: the network infrastructure located

3   within the determined buffer regions; the NSPs managing the identified network

4   infrastructure within the determined buffer regions; and, for each selected customer site, a

5   distance of the identified network infrastructure from the selected customer site within

6   the buffer region for the selected customer site.

1   16.   A system, comprising:

2   a processor;

3   an output device in communication with the processor;

4   code executed by the processor to cause the processor to perform:

5   (i) receiving a selection of customer sites;

6   (ii) querying a database to determine geographical locations of the selected

7   network customer sites;

8   (iii) rendering, in a graphical user interface, representations of the selected

9   customer sites in a map at the geographical location of the selected sites in the

10. map;

11   (iv) receiving selection of at least one network service provider (NSP);

12   (v) querying the database to determine network infrastructure of the

13 selected NSP and geographical locations of the determined network

14 infrastructure; and

15   (vi) rendering representations of the determined network infrastructure in

16 a map at the determined geographical locations of the determined network

17   infrastructure to render a visualization of the geographical locations of the

18   selected customer sites and network infrastructure of the selected at least one NSP

19   in the map.

1   17.   The system of claim 16, wherein the determined network infrastructure

2   comprises at least one of a switch and a network path, and wherein the network

3   infrastructure geographical location comprises at least one of a switch site location and a

4   route of the network path.

1   18.   The system of claim 16, wherein the map comprises a street map, and

2   wherein the rendered map visualizes transportation corridors, and wherein the rendered

3   customer sites and network infrastructure are visualized superimposed over rendered

4   transportation corridors in the street map.

1   19.   The system of claim 16, wherein the code further causes the processor to

2   perform:

3   receiving user selection of one rendered customer site;

4   querying the database to determine information on the selected customer site; and

5   rendering the determined information on the selected customer site in a dialog

6   box.

1   20.   The system of claim 16, wherein the code further causes the processor to

2   perform:

3   querying connection information in the database to determine connections

4   between the rendered customer sites; and

5   rendering connections between the customer sites in the map to visualize the

6   determined connections.

1   21.   The system of claim 20, wherein the code further causes the processor to

2   perform:

3   receiving a query including search criteria with respect to a parameter concerning

4   network connectivity at the customer sites;

5   querying the database to determine connections between customer sites having

6   network connectivity information satisfying the search criteria included with the query;

7   and

8   rendering the determined connections in a different visual manner than those

9   connections that do not satisfy the search criteria.

1   22.   The system of claim 16, wherein the connection information includes

2   information on at least one of connected sites, connection bandwidth, and connection

3   circuit types.

1   23.   The system of claim 16, wherein the code further causes the processor to

2   perform:

3   receiving a definition of a buffer region with respect to a selected customer site;

4   querying the database to determine NSP network infrastructure located within the

5   defined buffer region;

6   rendering the buffer region around the rendering of the selected customer site in

7   the map; and

8   rendering the determined NSP network infrastructure within the defined buffer

9   region in the map.

1   24.   The system of claim 23, wherein NSP network infrastructure rendered

2   within the defined buffer region is rendered differently than NSP network infrastructure

3   rendered outside of the buffer region.

1   25   The system of claim 24, wherein the code further causes the processor to

2   perform:

3   generating a report identifying at least one of: the network infrastructure located

4   within the buffer region, the NSP managing the identified network infrastructure, and a

AMENDED SHEET

5 distance of the identified network infrastructure from the selected customer site for which

6 the buffer region is defined.

1   26.   The system of claim 16, wherein the network infrastructure includes

2 network switches and network paths, wherein rendering the representations of the

3 determined network infrastructure comprises rendering representations of the determined

4 switches in the map, and wherein the code further causes the processor to perform:

5   querying the database to determine network paths between the network switches

6 rendered in the map; and

7   rendering the network paths between the network switches in the map.

1   27.   The system of claim 26, wherein the map comprises a street map, and

2 wherein the network paths are rendered superimposed over transportation corridors

3 rendered on the map.

1   28.   The system of claim 26, wherein the code further causes the processor to

2 perform:

3   receiving user selection of a proposed path between the customer site and one

4 network switch;

5   rendering the proposed path in the map; and

6   generating and rendering information on the proposed path in the map, including

7 information on the distance of the proposed path.

1   29.   The system of claim 16, wherein the code further causes the processor to

2 perform:

3   receiving selection of a plurality of customer sites rendered in the map;

4   receiving a definition of parameters of a buffer region with respect to the selected

5 customer sites;

6   determining buffer regions for each of the selected customer sites satisfying the

7 defined parameters for the buffer region;

8   querying the database to determine NSP network infrastructure located within

9   each determined buffer region;

10   rendering each determined buffer region around each selected customer site in the

11   map; and

12   rendering the determined NSP network infrastructure within each defined buffer

13   region in the map.

14

1   30.   The system of claim 16, wherein the code further causes the processor to

2   perform:

3   generating a report identifying at least one of: the network infrastructure located

4   within the determined buffer regions; the NSPs managing the identified network

5   infrastructure within the determined buffer regions; and, for each selected customer site, a

6   distance of the identified network infrastructure from the selected customer site within

7   the buffer region for the selected customer site.

1   31.   An article of manufacture for causing operations to be performed, wherein

2   the operations comprise:

3   receiving a selection of customer sites;

4   querying a database to determine geographical locations of the selected ~~network~~

5   customer sites;

6   rendering, in a graphical user interface, representations of the selected customer

7   sites in a map at the geographical location of the selected sites in the map;

8   receiving selection of at least one network service provider (NSP);

9   querying the database to determine network infrastructure of the selected NSP and

10   geographical locations of the determined network infrastructure; and

11   rendering representations of the determined network infrastructure in a map at the

12   determined geographical locations of the determined network infrastructure to render a

13   visualization of the geographical locations of the selected customer sites and network

14   infrastructure of the selected at least one NSP in the map.

AMENDED SHEET

1   32.   The article of manufacture of claim 31, wherein the determined network

2   infrastructure comprises at least one of a switch and a network path, and wherein the

3   network infrastructure geographical location comprises at least one of a switch site

4   location and a route of the network path.

1   33.   The article of manufacture of claim 31, wherein the map comprises a

2   street map, and wherein the rendered map visualizes transportation corridors, and

3   wherein the rendered customer sites and network infrastructure are visualized

4   superimposed over rendered transportation corridors in the street map.

1   34.   The article of manufacture of claim 31, wherein the operations further

2   comprise:

3   receiving user selection of one rendered customer site;

4   querying the database to determine information on the selected customer site; and

5   rendering the determined information on the selected customer site in a dialog

6   box.

1   35.   The article of manufacture of claim 31, wherein the operations further

2   comprise:

3   querying connection information in the database to determine connections

4   between the rendered customer sites; and

5   rendering connections between the customer sites in the map to visualize the

6   determined connections.

1   36.   The article of manufacture of claim 35, wherein the operations further

2   comprise:

3   receiving a query including search criteria with respect to a parameter concerning

4   network connectivity at the customer sites;

5   querying the database to determine connections between customer sites having

6   network connectivity information satisfying the search criteria included with the query;

7   and

8   rendering the determined connections in a different visual manner than those

9   connections that do not satisfy the search criteria.

1   37.   The article of manufacture of claim 35, wherein the connection

2   information includes information on at least one of connected sites, connection

3   bandwidth, and connection circuit types.

1   38.   The article of manufacture of claim 31, wherein the operations further

2   comprise:

3   receiving a definition of a buffer region with respect to a selected customer site;

4   querying the database to determine NSP network infrastructure located within the

5   defined buffer region;

6   rendering the buffer region around the rendering of the selected customer site in

7   the map; and

8   rendering the determined NSP network infrastructure within the defined buffer

9   region in the map.

1   39.   The article of manufacture of claim 38, wherein NSP network

2   infrastructure rendered within the defined buffer region is rendered differently than NSP

3   network infrastructure rendered outside of the buffer region.

1   40.   The article of manufacture of claim 38, wherein the operations further

2   comprise:

3   generating a report identifying at least one of: the network infrastructure located

4   within the buffer region, the NSP managing the identified network infrastructure, and a

5   distance of the identified network infrastructure from the selected customer site for which

6   the buffer region is defined.

1   41.   The article of manufacture of claim 31, wherein the network infrastructure

2   includes network switches and network paths, wherein rendering the representations of

3   the determined network infrastructure comprises rendering representations of the

4   determined switches in the map, further comprising:

5   querying the database to determine network paths between the network switches

6   rendered in the map; and

7   rendering the network paths between the network switches in the map.

1   42.   The article of manufacture of claim 41, wherein the map comprises a

2   street map, and wherein the network paths are rendered superimposed over transportation

3   corridors rendered on the map.

1   43.   The article of manufacture of claim 41, wherein the operations further

2   comprise:

3   receiving user selection of a proposed path between the customer site and one

4   network switch;

5   rendering the proposed path in the map; and

6   generating and rendering information on the proposed path in the map, including

7   information on the distance of the proposed path.

1   44.   The article of manufacture of claim 31, wherein the operations further

2   comprise:

3   receiving selection of a plurality of customer sites rendered in the map;

4   receiving a definition of parameters of a buffer region with respect to the selected

5   customer sites;

6   determining buffer regions for each of the selected customer sites satisfying the

7   defined parameters for the buffer region;

8   querying the database to determine NSP network infrastructure located within

9   each determined buffer region;

10   rendering each determined buffer region around each selected customer site in the

11   map; and

12   rendering the determined NSP network infrastructure within each defined buffer

13   region in the map.

AMENDED SHEET

1   45.   The article of manufacture of claim 44, wherein the operations further

2   comprise:

3   generating a report identifying at least one of: the network infrastructure located

4   within the determined buffer regions; the NSPs managing the identified network

5   infrastructure within the determined buffer regions; and, for each selected customer site, a

6   distance of the identified network infrastructure from the selected customer site within

7   the buffer region for the selected customer site.

AMENDED SHEET